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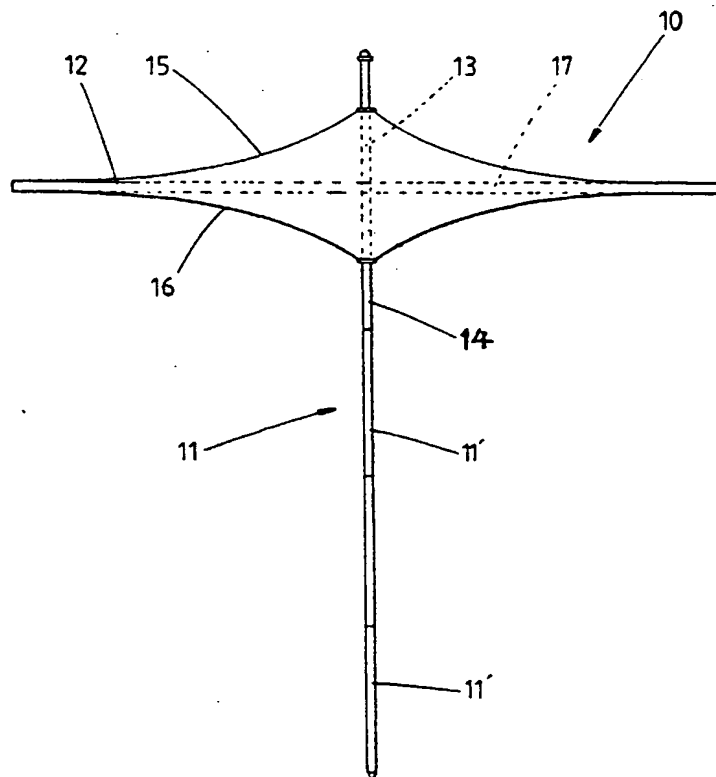
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<b>(21) International Application Number:</b> PCT/AU94/00435 <b>(22) International Filing Date:</b> 1 August 1994 (01.08.94)  <b>(30) Priority Data:</b> PM 0278                      2 August 1993 (02.08.93)                      AU  <b>(71)(72) Applicant and Inventor:</b> KUSTERMANN, Michael, Francis [AU/AU]; 76 Pildappa Avenue, Parkholme, S.A. 5043 (AU).  <b>(74) Agent:</b> R K MADDERN & ASSOCIATES; 345 King William Street, Adelaide, S.A. 5000 (AU).		<b>(81) Designated States:</b> AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD).  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> A COLLAPSIBLE SUNSHADE  <b>(57) Abstract</b>  <p>A collapsible sunshade comprises a collapsible central pole (11) and a circular canopy (12) supported adjacent the upper end of the pole (11), the pole (11) comprising a plurality of relatively short interconnected straight pole sections which, in the collapsed position of the pole (11), are separated from one another and are arranged in a bundle, whilst in the erected condition of the pole (11), are axially aligned in end-to-end abutting relationship, there being an elastic cord member (21) extending through the interior of the pole sections for resiliently holding same in said axial alignment. The canopy (12) comprises a flexible resilient one-piece hoop (17) extending around its outer periphery and a covering formed by a pair of membranes (15, 16) which connect to and support the hoop (17), the centre pole (11) extending upwardly through the centre of the membranes (15, 16). In the collapsed condition of the sunshade, the hoop (17) is twisted into a series of smaller diameter loops with the bundle of pole sections located between the loops.</p>		



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## A COLLAPSIBLE SUNSHADE

This invention relates to an improved collapsible sunshade, the term "sunshade" being intended to include umbrellas, parasols and other like devices.

Conventional beach umbrellas are generally rather bulky heavy and cumbersome to transport, particularly by hand by a single person. Furthermore, when in use, they are prone to be blown away when a gust of wind catches them from beneath or blows across the underside of the cover, creating a high pressure zone which tends to lift the cover and in turn the support pole or shaft out of the ground.

Another means of sun protection is for a person to simply wear a sun hat, however, hats do not provide enough shade to protect the body from the harmful rays of the sun and are also easily blown away.

Known collapsible sunshades have been found to be unstable in windy conditions, difficult to erect and/or cumbersome to transport in their collapsed form.

It is the main object of the present invention to provide an improved collapsible sunshade which is of compact and lightweight construction, easily transportable and simple to erect.

Broadly according to this invention therefore an improved collapsible sunshade comprises a central pole manipulable between erected and collapsed conditions, a generally circular canopy supported by and surrounding the pole near its upper end, wherein said pole comprises a plurality of relatively short interconnecting straight pole or rod sections which, when the pole is in its erected condition, are aligned axially in end-to-end relationship, whilst when

the pole is in its collapsed condition, the pole or rod sections are axially separated from one another whereby the pole can be collapsed to a small bundle of pole sections, there being an elongate resilient member extending interiorly of the pole sections and resiliently holding same together in said axial alignment, the disengagement of the individual pole sections being resisted by the resilient member, and wherein said canopy comprises a flexible, resilient one-piece ring or hoop extending around its outer periphery and a covering of flexible material attached to said ring or hoop, said canopy being attached on opposite sides thereof to respective pole or rod sections.

Preferably the cover comprises a pair of flexible membranes which are circular and of the same diameter, there being an upper membrane extending across the upper circular opening of the hoop and a lower membrane extending across the lower opening of the hoop, each said membrane having an eyelet in its central region and through which passes a respective pole section of the pole assembly. The membranes can be made of fabric or plastics material. Preferably the membranes are joined to one another along their circumferences so as to form a hem through which the hoop or ring extends.

Preferably, each eyelet is loosely fitted around its respective pole section and can undergo limited sliding movement therealong. In order to limit inward movement of the eyelet, an abutment member, eg a washer, is secured to the pole section interiorly of the canopy.

Preferably the hoop or ring is made of fibreglass or steel, whilst the collapsible pole assembly is made of aluminium or plastic.

By using a pair of upper and lower membranes for the covering, when the sunshade is in its erected position, the

canopy approximately resembles the shape of a spinning top - namely with the upper membrane forming a cone having upwardly converging walls, and the lower membrane forming an inverted cone having downwardly converging walls, with the apexes of the cones being coincident with the axis of the pole assembly.

With this invention, a sunshade is able to be collapsed into a very compact form by manually axially separating adjacent pole sections of the pole from one another and bundling them together, and in turn twisting the resilient hoop or ring into two or preferably three smaller loops. Preferably the diameter of the collapsed ring or hoop is approximately one third of its original size. If the hoop is only twisted into two sections, this results in a less compact collapsed shape. In order to erect the sunshade, it is a matter of simply releasing the ring or hoop from its twisted configuration so that it will automatically spring back into its original single hoop shape, following which the individual pole sections are released so that they once again interconnect together in axial alignment, this being achieved by virtue of the spring forces exerted on the pole sections by the elongate resilient member extending through the pole. The erection of the sunshade can be carried out with only minimal effort on the part of the assembler.

The sunshade of this invention is intended to provide protection from the sun for a single user; however, the principle of its construction can also be used to construct larger models for multiple users.

In order to further explain the present invention, a preferred embodiment thereof is described hereunder with reference to and illustrated in the accompanying drawings in which;

Fig. 1 shows a perspective view of the sunshade in its erected condition;

Fig. 2 is a top plan view of the sunshade shown in Fig 1;

Fig. 3 is a plan view showing the sunshade in a partly collapsed condition, namely with the pole fully collapsed and the canopy lying upside down prior to twisting the ring or hoop into its collapsed form for packing;

Figs. 4(a)-(c) show how the peripheral ring or hoop of the canopy is folded or twisted into its collapsed form for packing or storage, this being done by applying pressure on opposite sides of the resilient ring and twisting it into three loops of approximately equal diameters as shown in Fig. 4(c) wherein it is ready for storing in a carry bag;

Fig. 5 is a vertical sectional view of the sunshade shown in Fig. 1;

Fig. 6 is a fragmentary sectional view of the canopy shown in Fig. 5;

Fig. 7 is a fragmentary sectional view taken through the upper end of the pole and upper membrane of the canopy;

Fig. 8 is a fragmentary sectional view taken through an intermediate portion of the pole and the lower member of the canopy;

Fig. 9 is a fragmentary sectional view taken through the centre pole, showing the interengagement of adjacent pole sections; whilst

Fig. 10 is a vertical sectional view taken through the bottom pole section.



In this embodiment, a portable collapsible sunshade 10 comprises a centre pole or shaft 11 and a circular canopy 12 adjacent the upper end of the pole 11, the pole 11 itself comprising a plurality of relatively short interconnected straight pole sections which, when the pole 11 is in its erected condition, are aligned axially with their adjacent ends engaged in a spigot-socket type manner.

As shown in Figs. 1 and 5 of the drawings, the pole 11 extends through the centre of the canopy 12 with the uppermost pole section 13 protruding through the upper side of the canopy 12 and the immediately adjacent pole section 14 protruding through the lower side of the canopy 12.

The canopy 12 comprises a flexible resilient ring or hoop 17 and a pair of cloth or fabric membranes 15, 16 which are joined along their circumferences and which support the ring or hoop 17. As shown in Fig. 6 of the drawings, the ring or hoop 17 is contained within a channel or hem 18 which extends around the periphery of the canopy 12.

As shown in Fig. 5, with the canopy in its erected condition, the pair of membranes 15, 16 form conical shapes by virtue of their centre regions being displaced outwardly in opposite directions by means of the pole sections 13, 14 respectively when those sections are joined together in axial alignment.

Referring to Fig. 7 of the drawings, the upper membrane 15 of the canopy 12 is provided with a central eyelet 20 through which extends the pole section 13 of the pole assembly 11, the eyelet 20 in this embodiment, being loosely fitted to the pole section 13 so that it can slide relative thereto. A washer 19 is secured, eg by welding, to the pole section 13 to limit the extent of inward movement of the eyelet 20 and against which the eyelet will abut when the canopy 12 is erected.

An elastic cord 21 pass through the interior of the pole 11, with the upper end of the cord 21 being formed with a loop 22 which attaches to a hook 23 formed on an end cap fitting 24 inserted into the upper open end of the pole section 13. The cord 21 has its bottom or lower end attached in a similar manner to an end cap fitting 25 which is inserted into and frictional retained at the bottom end of the pole assembly 11 (refer Fig. 10).

The lower membrane 16 of the canopy 12 is also provided with a central eyelet 28 which similarly loosely fits on pole section 14 and can slide relative thereto. A washer 29 is fixed to pole section 14, interiorly of the canopy 12, and serves as an abutment for eyelet 28. The location of the abutments 19, 29 may be varied to in turn vary the cone angles of the membrane 15, 16 when the canopy 12 is erected.

It will of course be appreciated that the membranes 15, 16 may be attached to their respective pole sections 13, 14 in a number of different ways, eg by directly attaching a central portion of the membrane around the outer surface of the pole section.

The adjacent pole sections 11' of the pole assembly 11 are interengaged in a spigot/socket manner (refer Fig. 9 of the drawings) with the outer walls of adjacent pole sections being flush with one another when interconnected. The pole sections of the pole assembly 11, when erected, are retained together in axially aligned relationship by means of the tensioned elastic cord 21.

The manner in which the sunshade 10 is collapsed into its storage condition is shown in Fig. 3 and Figs. 4(a)-(c). Initially, the pole assembly 11 is collapsed by axially separating the individual pole sections of the pole 11 and arranging same in a bundle as shown in Fig. 3. The ring or hoop 17 is then twisted into its collapsed form by initially

applying manual pressure on opposite sides of the ring 17 and subsequently twisting same into a multiple of loops of approximately equal diameters - in this embodiment there being three such loops. In the fully collapsed condition, the bundle of pole sections are situated between the layers created by the three loops (refer Fig. 4(c)).

When in its collapsed condition, the sunshade 10 can be conveniently packed in a small size carry bag (not shown).

The sunshade 10 can be re-assembled into its erected condition without distortion of shape by unfolding the small diameter loops of the ring or hoop 17, following which the pole sections of the pole assembly 11 automatically interlock with one another and axially align themselves by virtue of the tension forces exerted by the internal elastic cord 21. Very little effort is required on the part of assembler in order to convert the sunshade from its collapsed to its fully erected condition.

By virtue of its compact size when in the collapsed condition, the sunshade is ideal for carrying on a bicycle or public transport.

In addition, the symmetrical and tensile nature of its canopy provides stability in windy conditions and the sunshade itself will not easily be blown out of the ground by wind gusts. Still further, because there are no projecting portions or protrusions around the circumference of the canopy, the sunshade is extremely safe.

A brief consideration of the above described embodiment will indicate that the invention provides a collapsible sunshade or umbrella which is of extremely simple construction, lightweight, durable, easily transportable and relatively inexpensive to manufacture.

The claims defining the invention are as follows:

1. A collapsible sunshade comprising a central collapsible straight pole assembly and a generally circular canopy supported by and surrounding the pole assembly adjacent its upper end, wherein said pole assembly comprises a plurality of relatively short interconnected straight pole sections which, when the pole assembly is in an erected condition, are aligned axially in end to end abutting relationship, and an elongate resilient member extending internally of the pole sections and arranged to retain said pole sections in said axially aligned relation, said pole assembly being collapsed by separating adjacent ends of adjacent said pole sections to thereby permit the pole sections to be arranged in a small bundle, the separation of the pole sections being resisted by said resilient member, and wherein said canopy comprises a flexible resilient one-piece ring or hoop extending around its outer periphery and a covering of flexible material attached to said ring or hoop, said one-piece ring or hoop, when the sunshade is collapsed, being twisted into a multiple of smaller diameter loops.

2. A collapsible sunshade according to claim 1 wherein said covering comprises a pair of flexible circular membranes extending across the upper and lower circular openings of said ring or hoop, said membranes attaching to respective said pole sections of the pole assembly centrally thereof.

3. A collapsible sunshade according to claim 2 wherein said membranes are joined together along their outer circumferences so as to form a hem in which said hoop or ring is located.

4. A collapsible sunshade according to either claim 2 or claim 3 wherein each said membrane is provided with a central eyelet through which passes a respective said pole section of the pole assembly, said eyelets loosely fitting around said

pole sections.

5. A collapsible sunshade according to claim 4 wherein each of the pole sections attached to said membranes, is provided with a fixed abutment, located interiorly of the canopy, against which a respective said eyelet abuts when the canopy is erected.

6. A collapsible sunshade according to any one of the preceding claims wherein said resilient hoop or ring is twisted into two or three smaller diameter loops when the canopy is in its collapsed condition.

7. A collapsible sunshade according to any one of the preceding claims wherein adjacent ones of said pole sections interengage in a spigot/socket manner, with the outer walls of adjacent pole sections lying flush with one another.

8. A collapsible sunshade according to any one of the preceding claims wherein the opposite ends of said resilient member are anchored to respective end cap fittings inserted in the open ends of the end pole sections of the pole assembly.

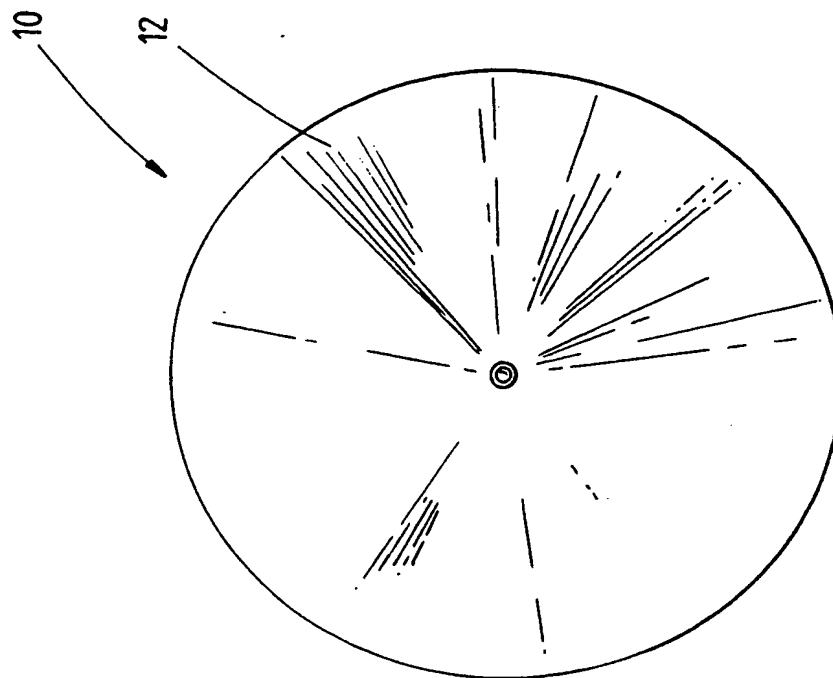
9. A collapsible sunshade according to any preceding claim wherein said resilient member is an elastic cord.

10. A collapsible sunshade according to any one of the preceding claims wherein said hoop or ring is formed of fibreglass or steel.

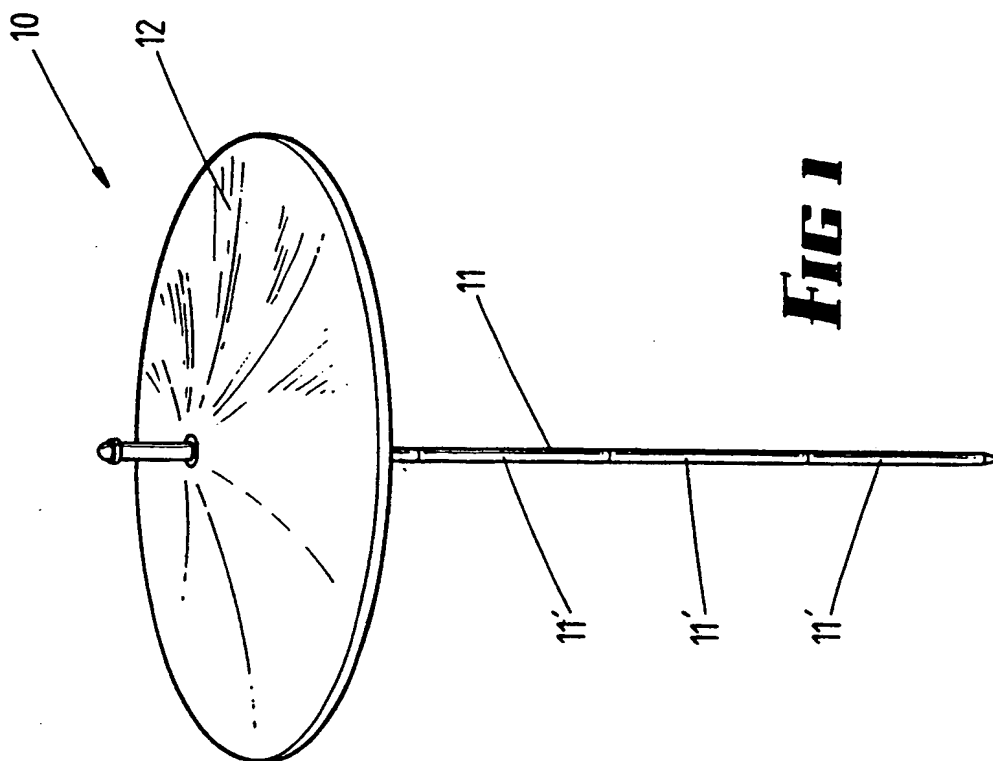
11. A collapsible sunshade according to any one of the preceding claims wherein said covering is formed of fabric material.

12. A collapsible sunshade substantially as hereinbefore described with reference to and illustrated in the accompanying drawings.

1 / 4

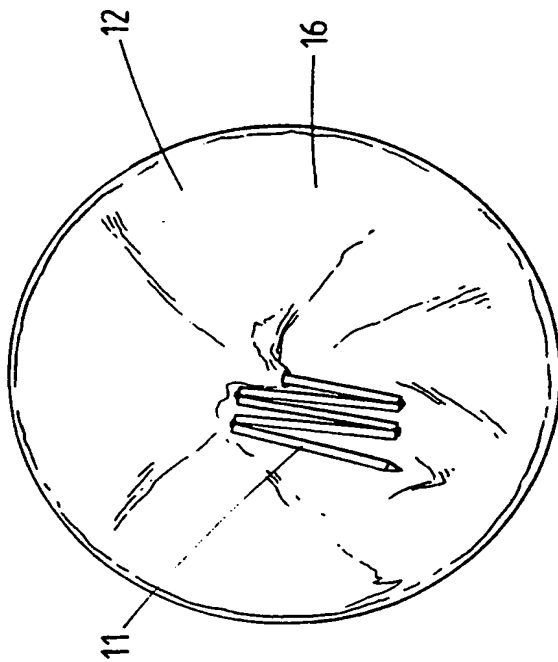


**FIG 2**

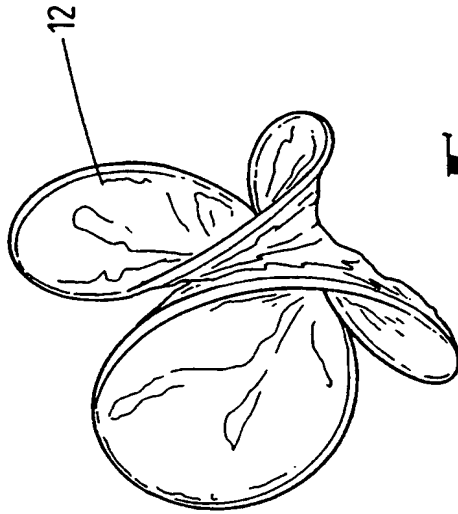


**FIG 1**

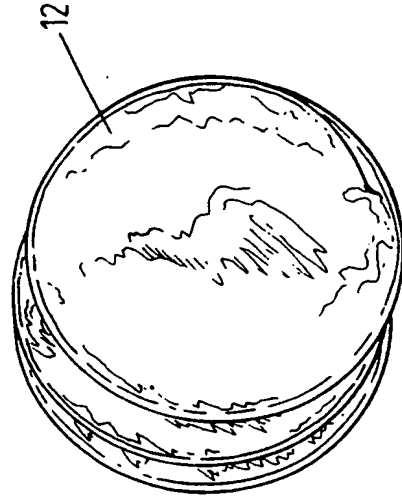
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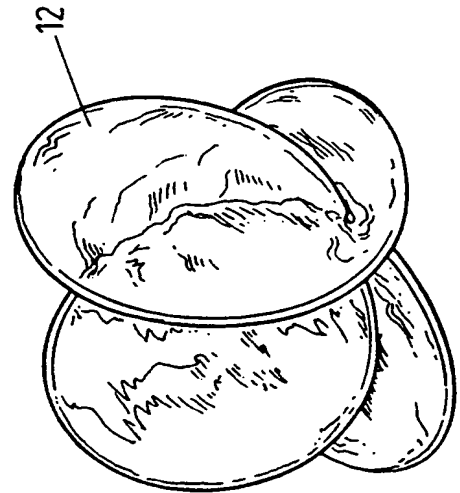
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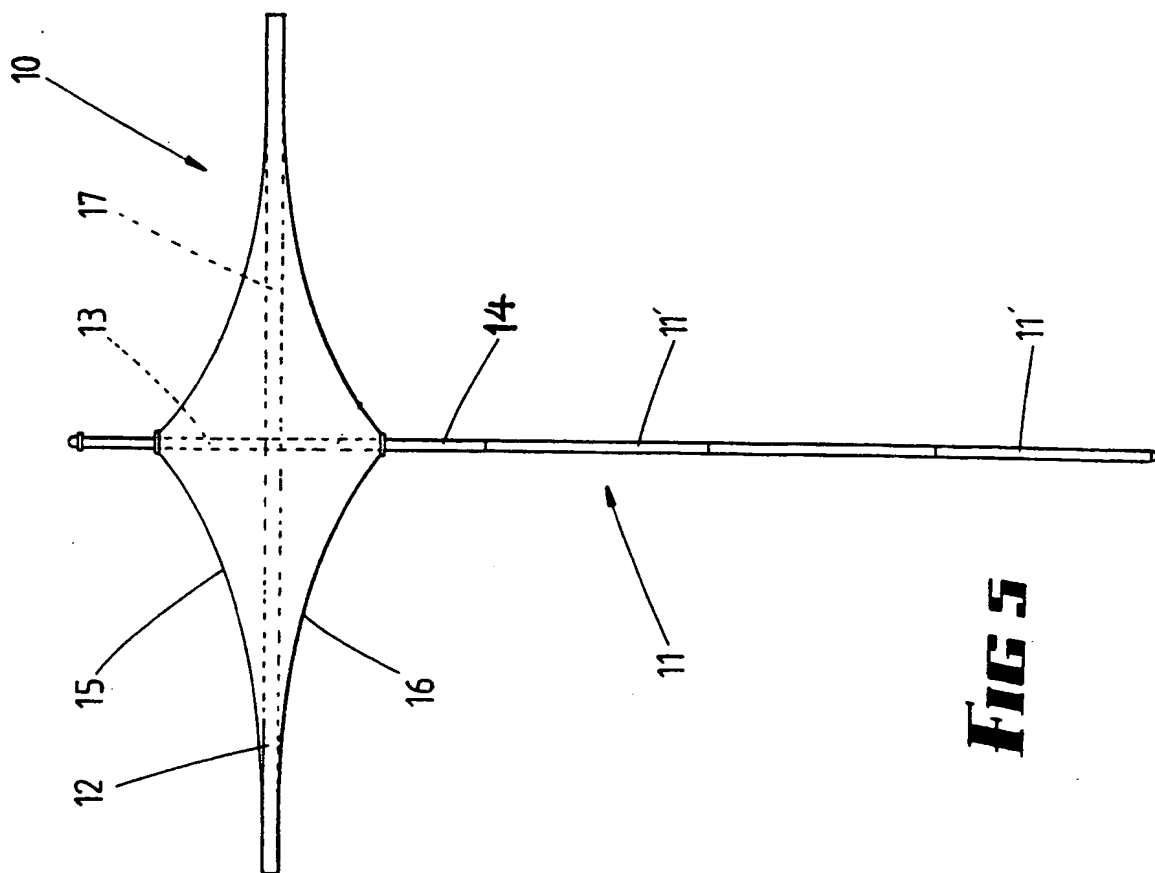
**FIG 4a**



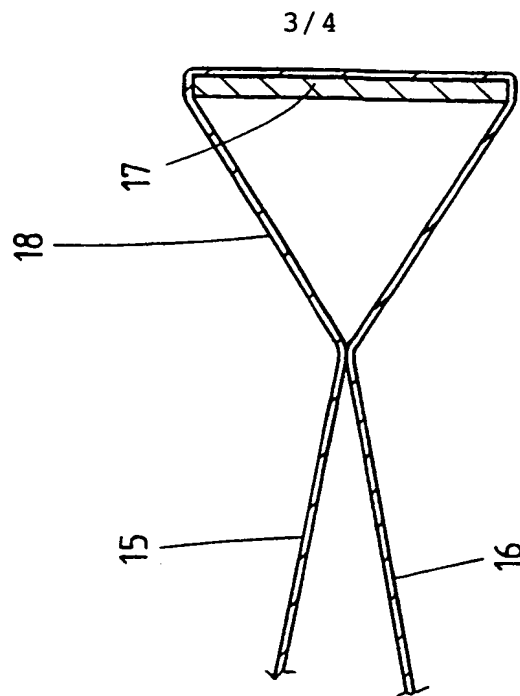
**FIG 4c**



**FIG 4b**



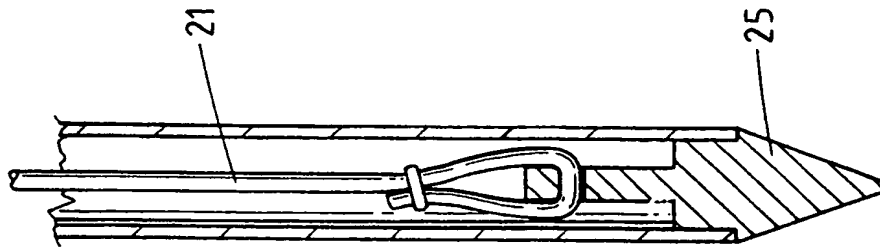
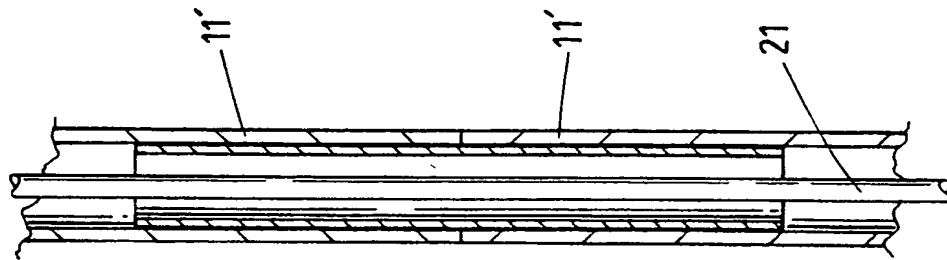
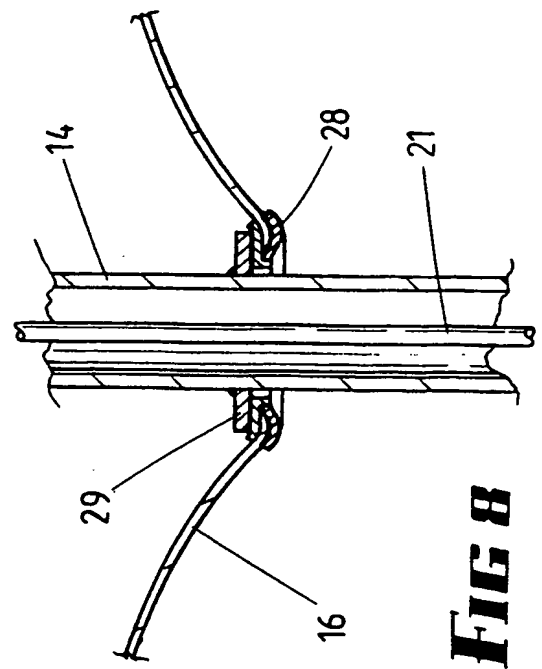
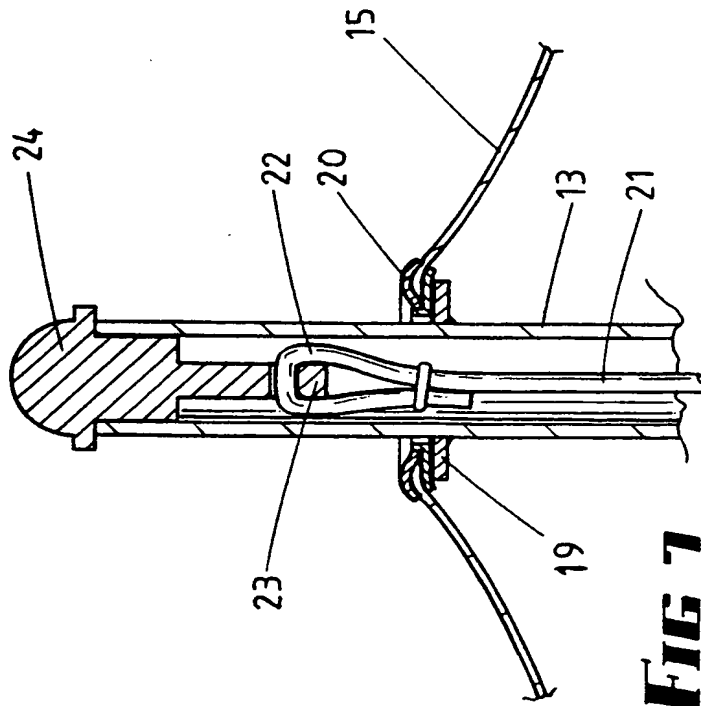
**FIG 5**



**FIG 6**



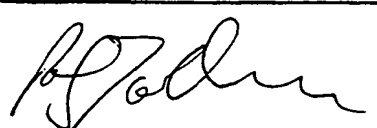
4 / 4



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU 94/00435

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> Int. Cl.6 A45B 19/02, 19/08  According to International Patent Classification (IPC) or to both national classification and IPC					
<b>B. FIELDS SEARCHED</b>  Minimum documentation searched (classification system followed by classification symbols) IPC : A45B 19/02, 19/08  Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU : IPC as above  Electronic data base consulted during the international search (name of data base, and where practicable, search terms used) DERWENT : JAPIO :					
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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.			
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A	DE,A, 222401 (ZUMSTEIN-FRIEDLI) 1 October 1942 (01.10.42) Whole document	1-12			
A	GB,A, 490169 (ONO) 10 August 1938 (10.08.38) Whole document	1-12			
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<div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Further documents are listed in the continuation of Box C.         </div> <div> <input type="checkbox"/> See patent family annex.         </div> </div>					
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Name and mailing address of the ISA/AU  AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION PO BOX 200 WODEN ACT 2606 AUSTRALIA  Facsimile No. 06 2853929	Authorized officer  <div style="text-align: center;">   <b>R. TOLHURST</b>          Telephone No. (06) 2832187       </div>				